

MH 185 Hall-effect sensor is a temperature stable, stress-resistant, micro-power latch. Superior high-temperature performance is made possible through a dynamic offset cancellation that utilizes chopper-stabilization. This method reduces the offset voltage normally caused by device over molding, temperature dependencies, and thermal stress.

The MH 185 includes the following on a single silicon chip: voltage regulator, Hall voltage generator, small-signal amplifier, chopper stabilization, Schmitt trigger, and a short circuit protected open-drain output. Advanced CMOS wafer fabrication processing is used to take advantage of low-voltage requirements, component matching, very low input-offset errors, and small component geometries.

This device requires the presence of both south and north polarity magnetic fields for operation. In the presence of a south polarity field of sufficient strength, the device output latches on, and only switches off when a north polarity field of sufficient strength is present.

The MH 185 is rated for operation between the ambient temperatures -40°C and 125°C for the K temperature range. The two package styles available provide magnetically optimized solutions for most applications. Package SO is an SOT-23, a miniature low-profile surface-mount package, while package UA is a three-lead ultramini SIP for through-hole mounting.

The package type is in a lead (Pb)-free version was verified by third party Lab.

Features and Benefits

- Micro-Power Latch function down to 8uA (Avg) supply current
- CMOS Hall IC Technology
- Solid-State Reliability
- Bipolar Output CMOS latch
- Operation down to 2.5V
- High Sensitivity Latch for direct “two reed switch application” replacement.
- Micro-power consumption for battery-powered applications
- 100% tested at 125°C for K spec/ Wide range of working Temperature
- RoHS is qualified by 3 party lab

Applications

- Solid state high sensitivity latch function
- High sensitivity, latch function for “2 reed switch ” replacement in low duty cycle applications.
- Revolution counter in battery-powered applications
- Water Meter RPM detector

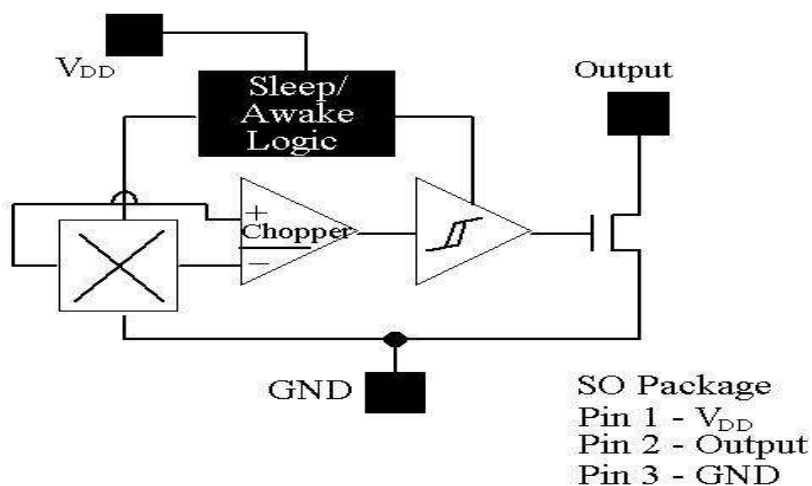
Ordering Information

XX-XXX-X-XX-XX-XX-X	Company Name and Product Category
	MH:MST Hall Effect/MP:MST Power MOSFET
	Part number
	181,182,183,184,185,248,249...
	Temperature range
	E: 85 Degree C, K: 125 Degree C, L: 150 Degree C
	Package type
	UA:TO-92S,SO:SOT-23,ST:Tsot-25,SU:USON
	Sorting
	α , β , Blank.....
	Package Identification Code
	01,02,03.....
	Handling Code
	BLANK: ESD bag, TR: Tape & Reel
	Lead Free Code
	BLANK: Lead Free Device ,G: Green
	Part number
	Temperature code
	Package type
	Sorting Code
	Package Identification
	Handling Code
	Lead Free

Part No.	Temperature Suffix	Package Type	Package Identification
185	K (-40°C to + 125°C)	UA (TO-92S)	01
	K (-40°C to + 125°C)	SO (SOT-23)	05

KUA spec is using in industrial and automotive application. Special Hot Testing is utilized.

Functional Diagram



Note: Static sensitive device; please observe ESD precautions. Reverse V_{DD} protection is not included. For reverse voltage protection, a 100 Ω resistor in series with V_{DD} is recommended.

Absolute Maximum Ratings

Supply Voltage (Operating), V_{DD}	5V
Supply Current (Fault), I_{DD}	1mA
Output Voltage, V_{OUT}	5V
Output Current (Fault), I_{OUT}	5mA
Operating Temperature Range, T_A	-40°C to +125°C
Storage Temperature Range, T_S	-55°C to +150°C

MH-185 Electrical Specifications

DC operating parameters: $T_A = 25^\circ\text{C}$, $V_{DD}=3V_{DC}$ (unless otherwise specified).

<i>Parameter</i>	<i>Symbol</i>	<i>Test Conditions</i>	<i>Min.</i>	<i>Typ.</i>	<i>Max.</i>	<i>Units</i>
Supply Voltage	V_{DD}	Operating	2.5		5	V
Supply Current	I_{DD}	Average		8		μA
Output Current	I_{OUT}				1.0	mA
Saturation Voltage	V_{SAT}	$I_{OUT} = 1\text{mA}$			0.4	V
Awake mode	T_{AW}	Operating		175		μs
Sleeping mode	T_{SL}	Operating			70	ms

Magnetic Specifications

DC operating parameters: $T_A = 25^\circ\text{C}$, $V_{DD}=3V_{DC}$ (unless otherwise specified).

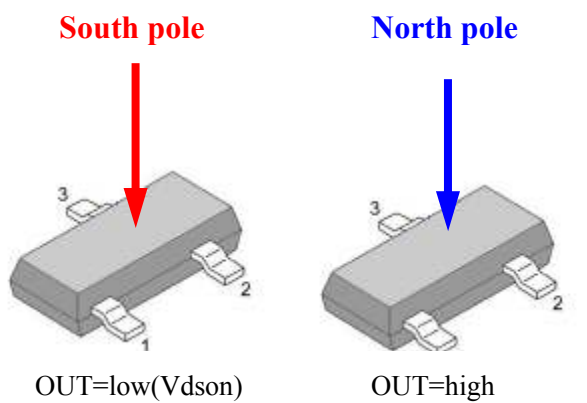
<i>Parameter</i>	<i>Symbol</i>	<i>Test Conditions</i>	<i>Min.</i>	<i>Typ.</i>	<i>Max.</i>	<i>Units</i>
Operating Point	B_{OP}		-6.0	-3.5	-0.5	mT
Release Point	B_{RP}		+0.5	+3.5	+6.0	mT
Hysteresis	B_{HYS}			7.0		mT

Note: 1 mT = 10 Gauss.

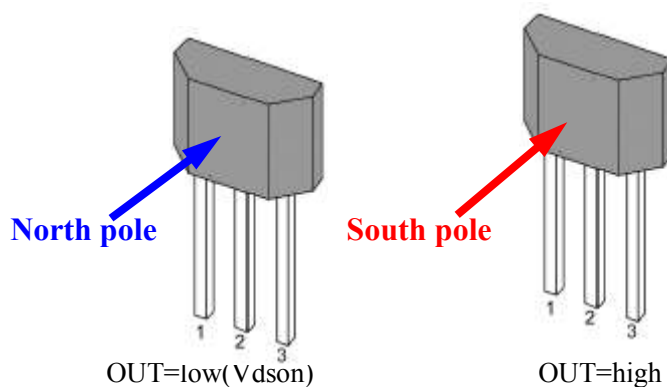
Output Behaviour versus Magnetic Pole

DC Operating Parameters $T_a = -40$ to 125°C , $V_{dd} = 2.5$ to 5V (unless otherwise specified)

<i>Parameter</i>	<i>Test condition(SO)</i>	<i>OUT(SO)</i>	<i>Test condition(UA)</i>	<i>OUT(UA)</i>
South pole	$B > B_{op}$	low	$B < B_{rp}$	high
North pole	$B < B_{rp}$	high	$B > B_{op}$	Low

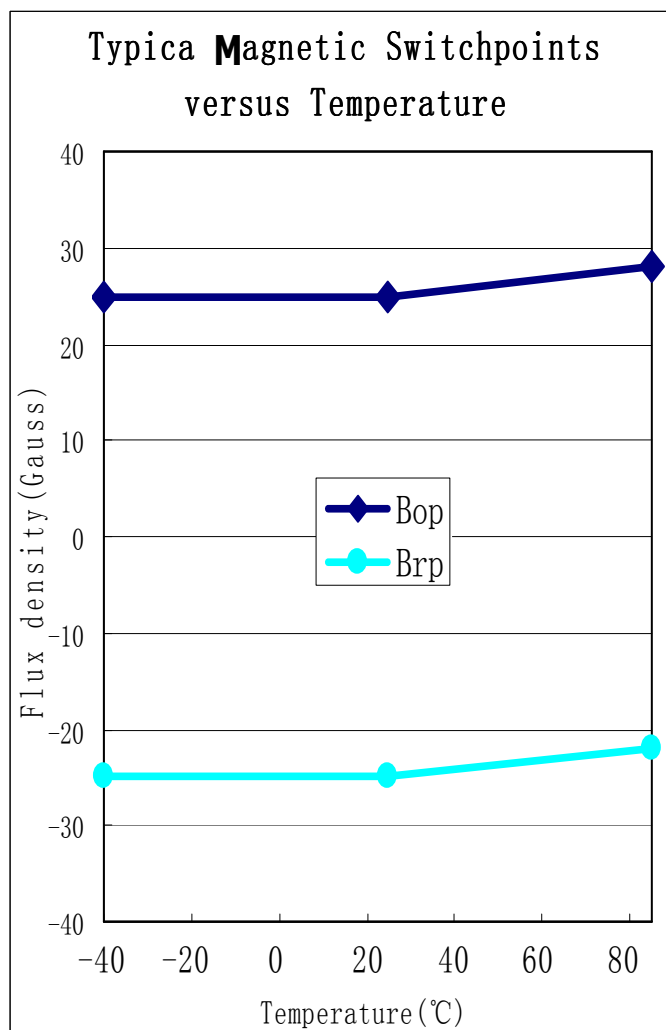
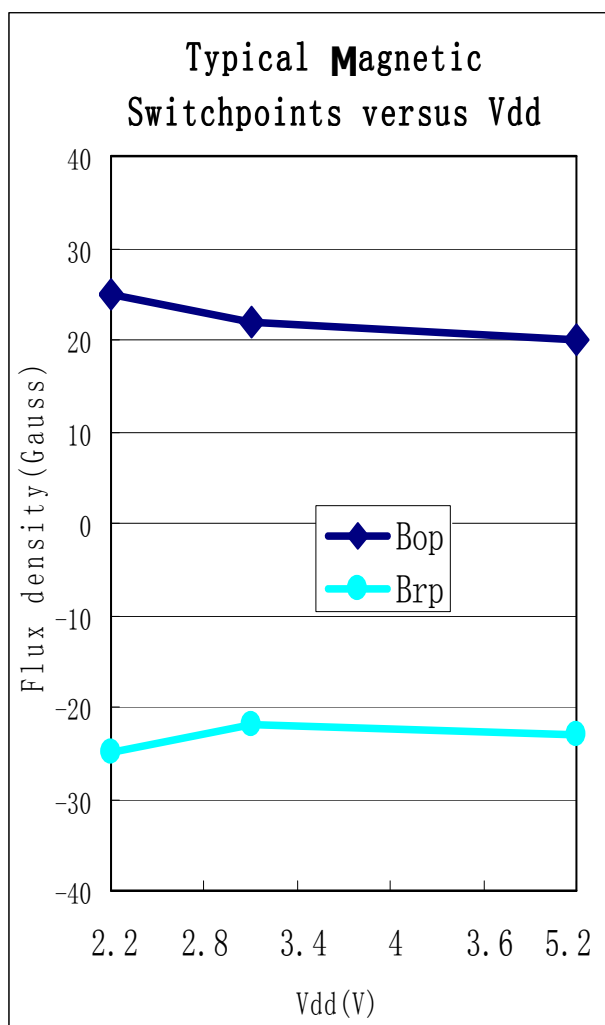


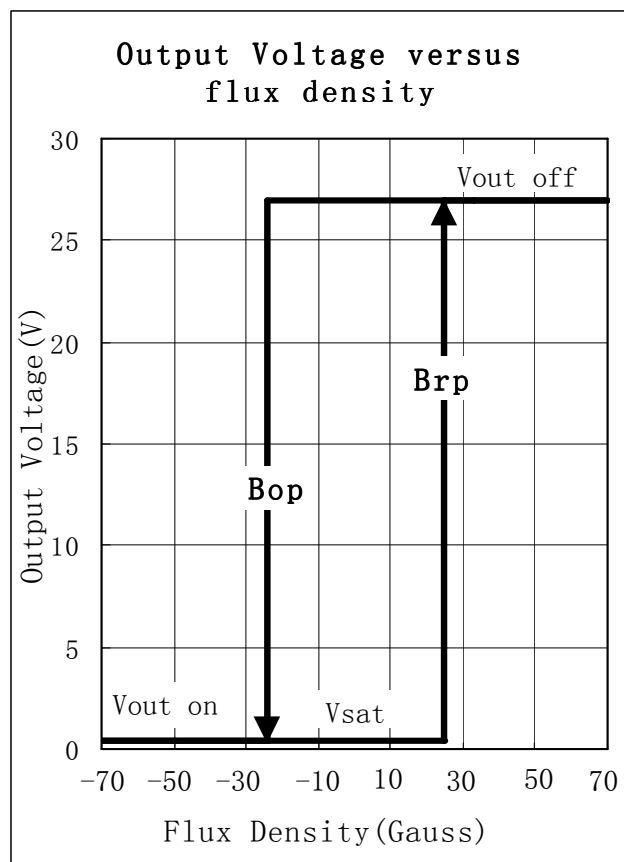
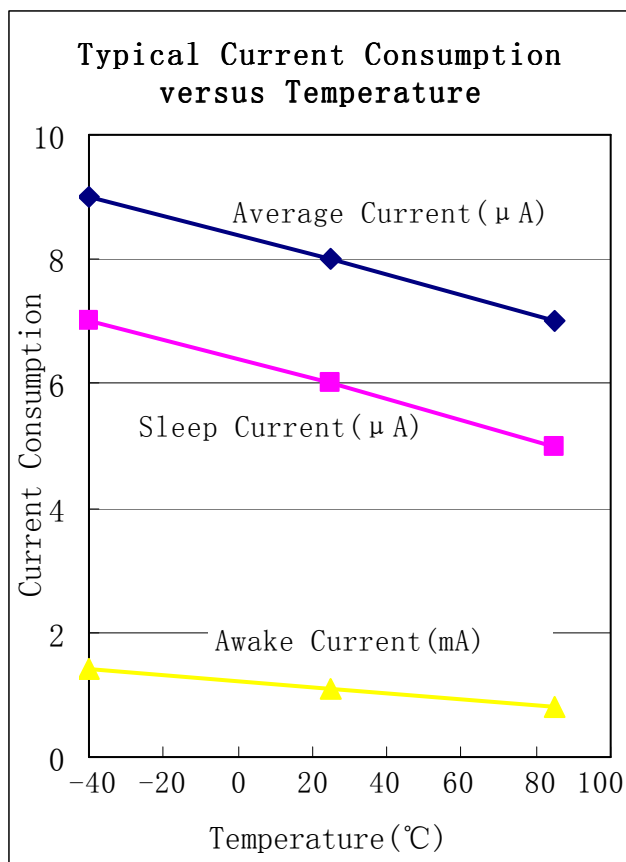
SO package



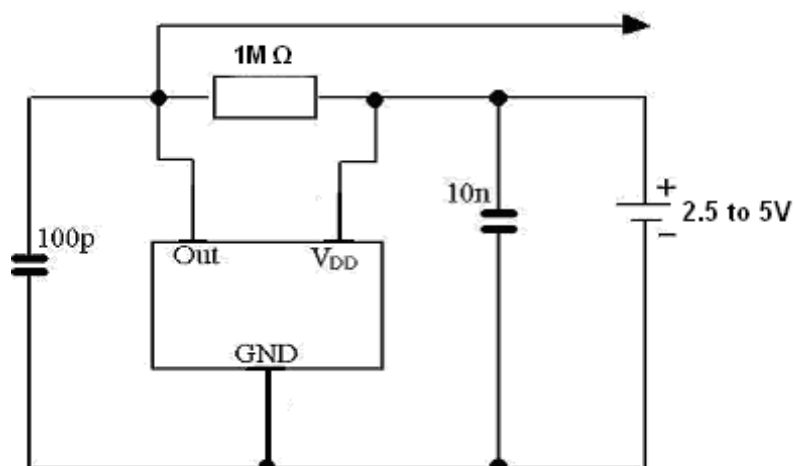
UA package

Performance Graphs



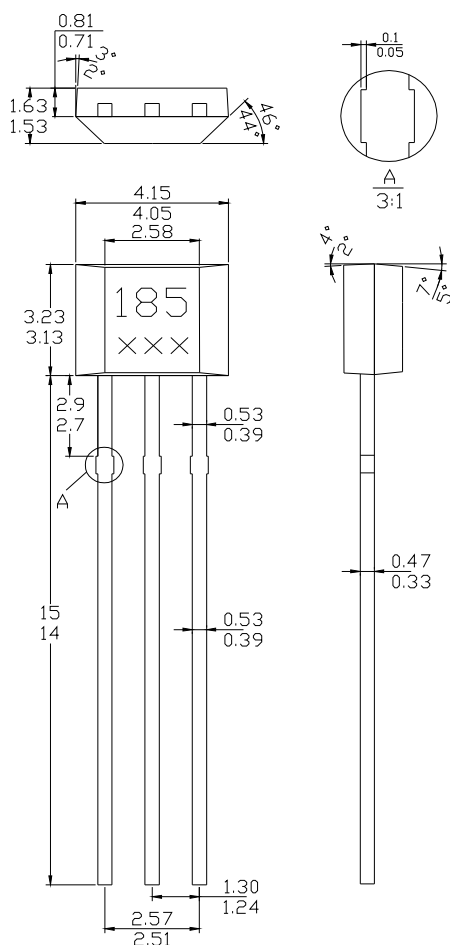


Typical Application



Package Physical Characteristics and sensor location

MH 185 UA-01 Package

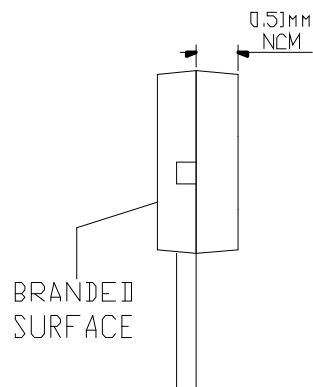


NOTES:

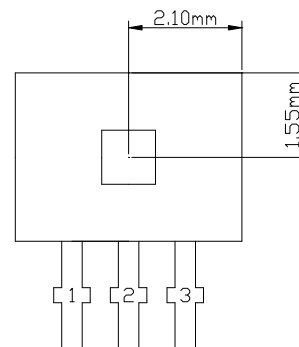
- 1).Controlling dimension: mm
- 2).Leads must be free of flash and plating voids
- 3).Do not bend leads within 1 mm of lead to package interface.

4).PINOUT:

Pin 1	VDD
Pin 2	GND
Pin 3	Output



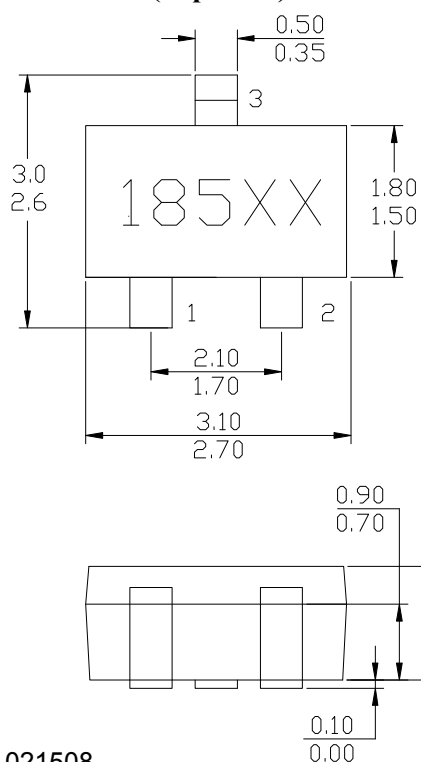
Active Area Depth



Sensor Location

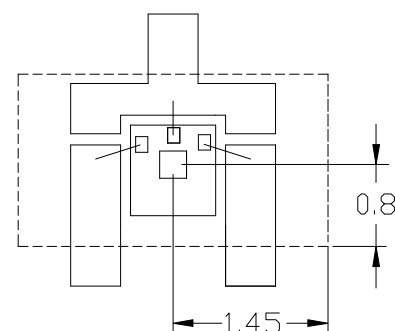
MH 185 SO-05 Package

(Top View)



SOT-23 Hall Plate / Chip Location

(Bottom view)

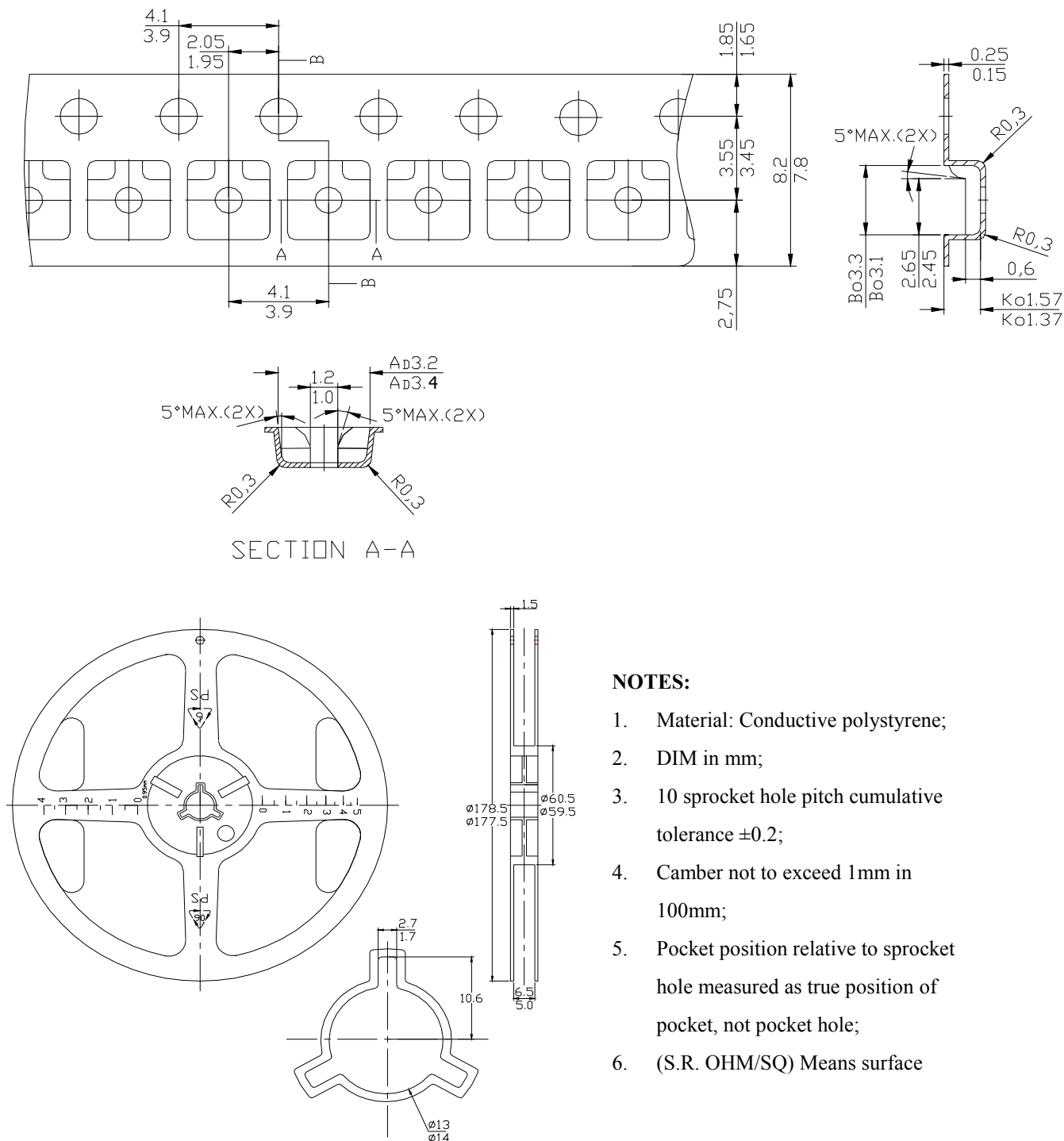


NOTES:

1. PINOUT (See Top View at left:)

Pin 1	VDD
Pin 2	Output
Pin 3	GND
2. Controlling dimension: mm;
3. Lead thickness after solder plating will be 0.254mm maximum.

Sot 23 Tape on Reel dimension



NOTES:

1. Material: Conductive polystyrene;
2. DIM in mm;
3. 10 sprocket hole pitch cumulative tolerance ± 0.2 ;
4. Camber not to exceed 1mm in 100mm;
5. Pocket position relative to sprocket hole measured as true position of pocket, not pocket hole;
6. (S.R. OHM/SQ) Means surface